



## CLASS V UIC STUDY FACT SHEET GEOTHERMAL ELECTRIC POWER WELLS

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**What is a geothermal electric power well?**

Geothermal electric power wells are Class V underground injection control (UIC) wells used to dispose of spent (meaning cooled) geothermal fluids following the extraction of heat for the production of electric power.

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**What types of fluids are injected into geothermal electric power wells?**

Geothermal fluids extracted from subsurface hydrothermal systems. The characteristics of these fluids vary, with some having high concentrations of total dissolved solids (TDS) and/or metals. In some cases, power plants add supplemental water from other sources, such as surface waters, storm waters, ground water, and wastewater treatment effluent.

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**Do injectate constituents exceed drinking water standards at the point of injection?**

Available sampling data show that concentrations of some metals (e.g., antimony, arsenic, cadmium, lead, mercury, strontium, zinc) and other constituents in the injected geothermal fluids routinely exceed primary drinking water standards or health advisory levels at one or more geothermal fields. The data also indicate that sulfate, chloride, manganese, iron, pH, and TDS frequently exceed secondary drinking water standards.

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**What are the characteristics of the injection zone of a geothermal electric power well?**

Geothermal fluids used for electric power generation are normally injected into the same subsurface hydrothermal system from which they were produced. A majority of geothermal injection wells were drilled as production wells and subsequently converted to injection wells.

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**Are there any contamination incidents associated with geothermal electric power wells?**

One monitoring investigation showed that at a geothermal power plant site in HI, the temperature, chloride concentrations, and chloride/magnesium ratios in the surrounding ground waters increased following a well failure during the drilling of an injection well.

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**Are geothermal electric power wells vulnerable to spills or illicit discharges?**

Geothermal electric power wells are not vulnerable to receiving spills or illicit discharges because geothermal fluids are handled in closed piping systems that are managed as an integral part of the power plant system.

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**How many geothermal electric power wells exist in the United States?**

There are a total of 234 documented geothermal electric power wells. The number of geothermal power injection wells is not expected to increase substantially in the foreseeable future.

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**Where are geothermal electric power wells located within the United States?**

CA, UT, HI, and NV have all of the 234 documented wells, with most of the wells reported in CA (174, or 74 percent) and NV (53, or 23 percent).

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**How are geothermal electric power wells regulated in states with the largest number of this type of well?**

*Individual permit:* CA, HI, NV, UT

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**Where can I obtain additional information on geothermal electric power wells?**

For general information, contact the Safe Drinking Water Hotline, toll-free 800-426-4791. The Safe Drinking Water Hotline is open Monday through Friday, excluding federal holidays, from 9:00 a.m. to 5:30 p.m. Eastern Standard Time. For technical inquiries, contact Amber Moreen, Underground Injection Control Program, Office of Ground Water and Drinking Water (mail code 4606), EPA, 401 M Street, SW, Washington, D.C., 20460. Phone: 202-260-4891. E-mail: [moreen.amber@epa.gov](mailto:moreen.amber@epa.gov). The complete Class V UIC Study (EPA/816-R-99-014, September 1999), which includes a volume addressing geothermal electric power wells (Volume 17), can be found at <http://www.epa.gov/OGWDW/uic/cl5study.html>.

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